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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/964,009	09/26/2001	Yinon Degani	60-40-1-1	1874

7590 02/26/2003  
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EXAMINER

NGUYEN, DILINH P

ART UNIT PAPER NUMBER

2814

DATE MAILED: 02/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/964,009

Applicant(s)

DEGANI ET AL.

Examiner

DiLinh Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 December 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 10-12 and 19-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 10-12 and 19-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election with traverse of Embodiment 1 in Paper No. 3 is acknowledged. The traversal is on the ground(s) that applicants point out that all pending claims of the application read on this embodiment. This is not found persuasive because:

Claims 1, 10-12 and 19-21 are disclosed a semiconductor device comprising: a substrate; a digital MCM; an RF MCM, wherein the RF MCM and the digital MCM are electrically isolated and a Faraday cage around the RF solder bump conductor.

Claims 2-9 and 13-18 are disclosed a semiconductor device comprising: a substrate; a digital MCM; an RF MCM and a through hole interconnection through the digital MCM substrate electrically connecting an electrical node on the system substrate to an active electrical node on the RF MCM substrate exclusive of any electrical connection to an active electrical node on the digital MCM substrate.

Non-elected claims and Elected claims are patentably independent and distinct. Unpatentability of the Elected claims would not necessarily unpatentability of the Non-elected claims and otherwise. The requirement is still deemed proper and is therefore made FINAL.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (fig. 5) in view of Akram et al. (U.S. Pat. 5994166).

Applicant Admitted Prior Art (fig. 5) discloses a semiconductor device comprising: a substrate, a digital MCM, a RF MCM and means electrically connecting the RF MCM to the substrate.

Applicant Admitted Prior Art (fig. 5) fails to disclose the RF MCM on the digital MCM, and wherein the RF MCM and the digital MCM are electrically isolated.

Akram et al. disclose a semiconductor device (fig. 4, column 7, lines 27 et seq.) comprising:

a substrate 402; a substrate 420, wherein a chip 430 mounted on the substrate 420; a substrate 440; wherein a plurality of chips mounted on the substrate 440; and the substrates 402, 420 and 440 all electrically interconnected one on top of another by means of solder bumps, a first electrical connection 428 between the substrate 420 and the substrate 402, a second electrical connection 450 between the substrate 440 and the substrate 402, the first and second electrical connections being electrically isolated from one another; and wherein the substrate 420 and the substrate 440 are electrically isolated. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of AAPA to achieve dense packaging, as shown by Akram et al.

3. Claims 10-12 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant Admitted Prior Art (fig. 5) in view of Akram et al. (U.S. Pat. 5994166) and further in view of Vendramin (U. S. Pat. 5955789).

- Regarding claims 10-11 and 19, Applicant Admitted Prior Art (fig. 5) discloses a semiconductor device comprising:

a system substrate 73;

a RF MCM on a RF MCM substrate 81;

a digital MCM on a digital MCM substrate 76;

the first solder bump array connecting the RF MCM substrate to the system substrate, and wherein at least one of the first solder bump array is an RF solder bump conductor;

the second solder bump array. However, the AAPA fails to disclose the second solder bump array connecting the digital MCM substrate to the RF MCM substrate.

Akram et al. disclose a semiconductor device comprising: the first solder bumps array 126 connecting the first stacked substrate 116 to the system substrate 102; and the second solder bumps array 148 connecting the second stacked substrate 140 to the substrate 116 (cover fig., column 6, lines 5 et seq.) to achieve dense packaging (abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of AAPA to achieve dense packaging, as shown by Akram et al.

Applicant Admitted Prior Art (fig. 5) and Akram et al. fail to disclose a Faraday cage around the RF solder bump conductor.

Vendramin discloses a semiconductor device comprising: a plurality of ground solder balls 303 arranged around the signals connections solder balls 305 to form a Faraday cage to protect the active element from external HF wave interferences (abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of AAPA (fig. 5) and Akram et al. to protect the active element from external HF wave interferences, as shown by Vendramin.

- Regarding claims 12 and 20, Vendramin discloses the common ground is the ground of the active device.

### ***Response to Arguments***

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., Akram et al. lack any suggestion that one stacked device is electrically isolated from another) are not recited in the rejected claim(s) 10-12 and 19-20. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant's arguments filed 12/13/02 have been fully considered but they are not persuasive.

Regarding claims 10-12 and 19-20, the Applicant argues that Akram et al. never mentions RF devices. There is no real combination of references.

The Examiner disagrees.

Regarding claims 10-11 and 19, Applicant Admitted Prior Art (fig. 5) discloses a semiconductor device comprising:

- a system substrate 73;
- a RF MCM on a RF MCM substrate 81;
- a digital MCM on a digital MCM substrate 76;

the first solder bump array connecting the RF MCM substrate to the system substrate, and wherein at least one of the first solder bump array is an RF solder bump conductor;

the second solder bump array. However, the AAPA fails to disclose the second solder bump array connecting the digital MCM substrate to the RF MCM substrate.

Akram et al. disclose a semiconductor device comprising: the first solder bumps array 126 connecting the first stacked substrate 116 to the system substrate 102; and the second solder bumps array 148 connecting the second stacked substrate 140 to the substrate 116 (cover fig., column 6, lines 5 et seq.) to achieve dense packaging (abstract). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of AAPA to achieve dense packaging, as shown by Akram et al.

In response to applicant's argument that there is no real combination of references, such as: AAPA, Akram et al. and Vendramin, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined

teachings of the references would have suggested to those of ordinary skill in the art.

See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DiLinh Nguyen whose telephone number is (703) 305-6983. The examiner can normally be reached on 8:00AM - 6:00PM (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7724 for After Final communications.

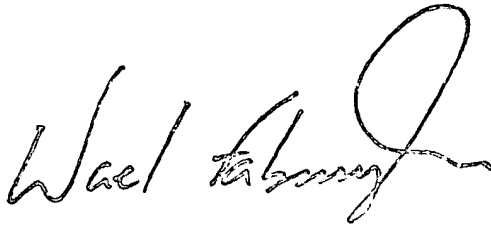


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

DLN

February 20, 2003



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